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File: DWPI

Jun 11, 2002

DERWENT-ACC-NO: 2001-390283

DERWENT-WEEK: 200321

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TITLE: Method for automatically extending bidding period, in auction performed online through communication network by checking whether or not new bid exists in given time period before bidding closing time

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PRIORITY-DATA: 1999KR-0058253 (December 16, 1999)

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## PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
<input type="checkbox"/> TW 490628 A	June 11, 2002		000	G06F017/60
<input type="checkbox"/> WO 200145002 A1	June 21, 2001	E	021	G06F017/60
<input type="checkbox"/> AU 200120291 A	June 25, 2001		000	G06F017/60
<input type="checkbox"/> KR 2001056681 A	July 4, 2001		000	G06F017/60
<input type="checkbox"/> KR 318209 B	December 24, 2001		000	G06F017/60

DESIGNATED-STATES: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

## APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
TW 490628A	December 11, 2000	2000TW-0126338	
WO 200145002A1	December 13, 2000	2000WO-KR01454	
AU 200120291A	December 13, 2000	2001AU-0020291	
AU 200120291A		WO 200145002	Based on
KR2001056681A	December 16, 1999	1999KR-0058253	
KR 318209B	December 16, 1999	1999KR-0058253	
KR 318209B		KR2001056681	Previous Publ.

INT-CL (IPC): G06 F 17/60

ABSTRACTED-PUB-NO: WO 200145002A

BASIC-ABSTRACT:

NOVELTY - An information on bidding closing time and a product to be auctioned to buyers are provided with at least one or more buyers may bid for the product while checking whether or not a new bid exists in a set time period before the bidding closing time. If a new bid exists in the set time period before the bidding closing time, the bidding closing time may be extended, and otherwise closing the auction at the bidding closing time.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for:

(a) a computer readable recording medium

USE - For performing an online auction using a computer network such as the Internet, for automatically extending a bidding period in which when a bidding closing time is set, a bidding period is automatically extended depending on the bidding situation at the bidding closing time.

ADVANTAGE - Provides an opportunity for additional bids so that the bidder who makes the highest bid or the most competitive conditions can ultimately win in the auction.

DESCRIPTION OF DRAWING(S) - The drawing is a flowchart for performing a method for automatically extending a bidding period according to the present invention.

ABSTRACTED-PUB-NO: WO 200145002A

EQUIVALENT-ABSTRACTS:

CHOSEN-DRAWING: Dwg.2/3

DERWENT-CLASS: S04 T01 T05

EPI-CODES: S04-C03C2; T01-H07C5; T01-J05A1; T05-L01D;

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
21 June 2001 (21.06.2001)

PCT

(10) International Publication Number  
**WO 01/45002 A1**

(51) International Patent Classification<sup>7</sup>: G06F 17/60

(72) Inventors; and

(21) International Application Number: PCT/KR00/01454

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(22) International Filing Date:  
13 December 2000 (13.12.2000)

(25) Filing Language: English

(26) Publication Language: English

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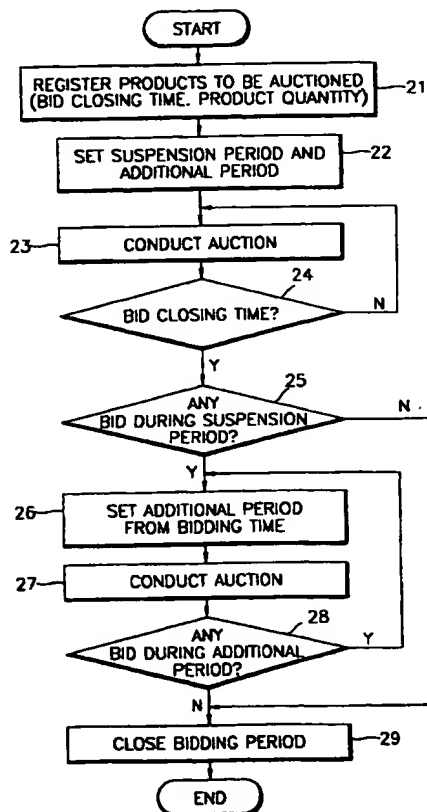
(30) Priority Data:  
1999/58253 16 December 1999 (16.12.1999) KR

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

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[Continued on next page]

(54) Title: METHOD FOR AUTOMATICALLY EXTENDING BIDDING PERIOD IN AUCTION SYSTEM USING COMPUTER NETWORK



(57) Abstract: A method for conducting an online auction using a computer network system is provided. The method for conducting an online auction using a communication network includes the steps of: (a) providing information on a bidding closing time and a product to be auctioned to buyers; (b) at least one or more buyers bidding for the product; (c) checking whether or not a new bid exists in a predetermined time period before the bidding closing time; and (d) if a new bid exists in the predetermined time period before the bidding closing time, extending the bidding closing time, and otherwise closing the auction at the bidding closing time. By doing so, a buyer who wants to a product to be auctioned has maximum bidding opportunities, while a seller can sell the product at the highest price.

WO 01/45002 A1



(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

**Published:**

— With international search report.

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

## METHOD FOR AUTOMATICALLY EXTENDING BIDDING PERIOD IN AUCTION SYSTEM USING COMPUTER NETWORK

### Technical Field

5           The present invention relates to a method for performing an online auction using a computer network system, and more particularly, to a method for automatically extending a bidding period in which when a bidding closing time is predetermined, a bidding period is automatically extended depending on the bidding situation at the bidding closing time.

### 10   Background Art

          In an auction, a seller registers a product to be auctioned, bidders bid on products, and the bidder whose bid the highest among the bids of the other bidders may purchase the auctioned product. Therefore, the bidding price for a product changes frequently, and the bidders who want to buy the  
15   product must always pay attention to the auction proceeding state.

          In an ordinary auction house, an auction is usually conducted without a bidding closing time, so that bidders bid on a product to be auctioned and then the bidder whose bid is the highest can purchase the auctioned product. However, in an online auction system using a computer network,  
20   a bidding closing time is usually predetermined for a product to be auctioned. By closing a bidding period at the bidding closing time, the bidder whose bid is the highest among the bids of the other bidders at the bidding closing time buys the product.

          In such cases where a bidding closing time is predetermined, if a  
25   bidder bids for a product immediately before the bidding closing time, the result of the auction can change depending on the bidder's bid. That is, if the bidder who bids for the product immediately before the bidding closing time offers a higher bid than the bids of other bidders, the bidder will ultimately purchase the product while any bidders who have intentions to  
30   offer higher bids cannot bid any more due to the closing of the bidding period.

Also, in a so-called "reverse auction", in which a buyer offers buying conditions, sellers offers selling conditions to meet the buying conditions, and then the buyer selects competitive selling conditions, the same problem occurs as in the above-described cases.

5        Due to the problem of the predetermined bidding closing time, a buyer who necessarily wants to buy the auctioned product even at a higher price than that of competing bidders may not win in an auction, or a seller in 'a reverse auction', who wants to offer better selling conditions than that of competing bidders may not win in an auction. Also, a seller may lose an  
10 opportunity in which the seller's product can be sold at a higher price, or a buyer of 'a reverse auction' may lose an opportunity in which the buyer can buy a product with better conditions.

#### Disclosure of the Invention

15        To solve the above problems, it is an objective of the present invention to provide a method for automatically extending a bidding period, the method in which an auction procedure is performed online between computers connected through a communication network such as the Internet, and the bidding period of the auction is automatically extended  
20 according to the auction proceeding situation of a bidding closing time to provide an opportunity for additional bids so that the bidder who makes the highest bid or the most competitive conditions can ultimately win in the auction, and a computer readable recording medium which stores a program for executing the method.

25        To accomplish the above object of the present invention, there is provided a method for automatically extending a bidding period, in an auction conducting method in which an auction is performed online through a communication network, the method for automatically extending a bidding period having the steps of: (a) providing information on a bidding closing  
30 time and a product to be auctioned to buyers; (b) at least one or more buyers bidding for the product; (c) checking whether or not a new bid exists

in a predetermined time period before the bidding closing time; and (d) if a new bid exists in the predetermined time period before the bidding closing time, extending the bidding closing time, and otherwise closing the auction at the bidding closing time.

5           It is preferable that the step (a) further has a step for setting a suspension period that is a predetermined time period before the bidding closing time and an additional period that is used to extend the bidding closing time; in the step (c) whether or not a new bid exists in the suspension period is checked; and in the step (d) the bidding closing time  
10 is extended according to the additional period.

          In this case, the extended bidding closing time can be determined through various methods. For example, the extended bidding closing time can be obtained by adding the additional period to the originally set bidding closing time, or by adding the additional period to the time of the new bid  
15 during the suspension time.

          It is preferable that at least one or more buyers requesting to change an auction mode into an auction extension mode where the bidding closing time of the auction can be extended. This means even an auction method in which the extension of bidding closing time is not considered can be  
20 requested to change into an auction method of the present invention in which the extension of the bidding closing time is considered.

          It is preferable that when a new bid exists in the step (c), if the new bid is lower than a bid which will be an accepted bid if the bidding period closes at the time of the new bid, the new bid is deemed not existing.

25           It is preferable that the method further has the step of (e) repeating the step (d) if a new bid exists during the extended period. It is preferable that when the step (d) is repeated in the step (e), a period to be extended is shorter than the previously extended period.

          To accomplish another object of the present invention, there is also  
30 provided a method for automatically extending a bidding period, in an auction conducting method in which an auction is performed online through

a communication network, the method for automatically extending a bidding period having the steps of: (a) a buyer providing buying condition information including the specification of a product which the buyer wants to buy; (b) at least one or more sellers providing sales condition information including the specification of a product which the sellers can provide responding to the buying condition information; (c) checking whether or not new sales condition information exists in a predetermined time period before the closing time for offering sales condition information; (d) if new sales condition information exists in the predetermined time period before the closing time, extending the closing time for offering sales condition information, and otherwise closing the auction at the closing time for offering sales condition information; and (e) the buyer determining products to buy with provided sales condition information after the closing time for offering sales condition information.

It is preferable that the step (a) further has a step for setting a closing time for offering sales condition information, a suspension period that is a predetermined time period before the closing time for offering sales condition information, and an additional period that is used to extend the closing time for offering sales condition information; in the step (c) whether or not new sales condition information is offered in the suspension period is checked; and in the step (d) the closing time for offering sales condition information is extended according to the additional period.

It is preferable that when new sales condition information is offered in the step (c), if the new sales condition information has a price higher than a price that is the lowest among sales condition information provided by the time of offering the new sales condition information, the new sales condition information is deemed not existing. This means that when a price, which is one of the important sales condition information, operates as the only factor in purchase decision, buyers need not consider new sales condition information with a higher price.

It is preferable that after the step (d) further having the step of: (d1)



repeating the step (d) if new sales condition information is offered during the extended period. Likewise, in this case, the new extended period can be determined as a period having a shorter period than the previous period.

To accomplish another object of the present invention, there is also  
5 provided a computer readable recording medium which stores a program for executing a method for conducting an auction online through a communication network, in which the method having the steps of: (a) providing information on a product to be auctioned; (b) at least one or more buyers bidding for the product; (c) checking whether or not a new bid exists  
10 in a predetermined time period before the bidding closing time; and (d) if a new bid exists in the predetermined time period before the bidding closing time, extending the bidding closing time, and otherwise closing the auction at the bidding closing time.

To accomplish another object of the present invention, there is also  
15 provided a computer readable recording medium which stores a program for executing a method for conducting an auction online through a communication network, in which the method having the steps of: (a) a buyer providing buying condition information including the specification of a product which the buyer wants to buy; (b) at least one or more sellers  
20 providing sales condition information including the specification of a product which the sellers can provide responding to the buying condition information; (c) checking whether or not new sales condition information exists in a predetermined time period before the closing time for offering sales condition information; (d) if new sales condition information exists in  
25 the predetermined time period before the closing time, extending the closing time for offering sales condition information, and otherwise closing the auction at the closing time for offering sales condition information; and (e) the buyer determining his buying intention with provided sales condition information after the closing time for offering sales condition information.

30

#### Brief Description of the Drawings

FIG. 1 illustrates the structure of a computer network system for performing the present invention;

FIG. 2 is a flowchart for performing a method for automatically extending a bidding period according to the present invention; and

5 FIGS. 3A and 3B illustrate examples for explaining the method for automatically extending a bidding period of FIG. 2.

#### Best mode for carrying out the invention

Hereinafter, embodiments of the present invention will be described  
10 in detail with reference to the attached drawings. Auctions can be roughly divided into two categories: one in which a seller offers a product and responding to this, buyers bid, and the other in which a buyer offers buying conditions and responding to this, sellers offer selling conditions. The explanation of the present invention will be made, taking the former as a  
15 standard, and similar explanation for the latter will be omitted to avoid redundancy.

FIG. 1 illustrates the structure of a computer network system for performing the present invention. A server computer 11 belongs to an auctioneer company which conducts an online auction. The server  
20 computer 11 communicates online with the bidder computers 16 through a communication network 15. Those who are willing to buy products in the online auction can participate in the online auction using bidder computers 16. A seller who provides a product for the auction can register products online with the server computer 11 after connecting a seller's computer (not  
25 shown) to the server computer 11 through the communication network 15.

The server computer 11 has a database for storing data for an auction. The database can include detailed bid information and the product information. The server computer 11 also stores a program for an ordinary auction and a program for automatically extending a bidding period. The  
30 server computer 11 performs processing for automatically determining a bidder whose bid is accepted and an accepted bid depending on conditions

offered by bidders.

The bidder computers 16 connected to the communication network 15 have Internet browsers (for example, Netscape, and Internet Explorer) which can display web contents encoded in Hyper Text Markup Language (HTML). The web browser makes each computer access and display the content of an online auction HTML templet in the server computer 11. The HTML templet of the server computer 11 has a main web page to be displayed for online auction users such as the bidder computers 16.

The bidder computer and facts on a bidder in this explanation can correspond to a seller computer and facts on a seller in the so-called "reverse auction". Here, the reverse auction means an auction method in which a buyer offers buying conditions, sellers offers selling conditions to meet the buying conditions, and then the buyer selects competitive selling conditions.

FIG. 2 is a flowchart for performing a method for automatically extending a bidding period according to the present invention.

A seller accesses the main home page of the server computer 11 through the browser of the seller's computer and registers a product to be auctioned in step 21. The seller inputs information on an auction method, a bidding closing time, the kind (category) of a product, the product name, the product specification, areas where the product can be sold, the available amount of the product, an auction start price, a reference address, etc., and the server computer 11 registers this sales information in a database. In 'a reverse auction', a buyer can register buying conditions for a desired product in a database.

The present invention can be applied to an auction which is conducted with a predetermined bidding period. Also, the present invention can be applied 'a reverse auction' which is conducted with a predetermined closing time for sellers' offering sales condition information. The present invention will now be explained centered on the extension of a bidding closing time which will be deemed to be applied to the closing time for

offering sales condition information.

The server computer 11 sets a suspension period and an additional period in relation to a bidding closing time. Referring to FIG. 3B, time  $t_4$  indicates a bidding closing time, and a suspension period ( $D_1$ ) means a time period which starts at  $t_0$  that is before the bidding closing time and ends at  $t_4$  that is the bidding closing time. In addition to this kind of suspension period, the end of a suspension period can be set at a predetermined time before the bidding closing time  $t_4$ .

If a bidder newly bids during the suspension period (for example, at time  $t_1$ ), a time period, which starts at the time of the new bidding and ends after a predetermined time period and during which bidders can bids, is referred to as an additional period (a time period from  $t_1$  to  $t_2$ ). Also, if a bidder newly bids again during the additional period ( $D_2$ ), another additional period ( $D_3$ ) can be made to start from the bidding time. In this case, the additional period can be made a shorter period than the previous additional period. This is to prevent the auction from extending too long.

The server computer 11 starts an auction by providing bidders with product information based on an auction start price of a product offered by the seller. Bidders can visit an auction market opened in the server computer 11 through the bidder computers 16 and bids for desired products. Using the browser of the bidder computer 16, a bidder retrieves product information provided by the server computer 11, selects desired products, and inputs information on a bid, delivery location and date, etc., in step 23.

Bid information provided by the bidder is transmitted to the server computer 11 through the communication network 15, and the server computer 11 stores detailed bid information by product in a database. The server computer 11 checks whether or not it is a bidding closing time for the corresponding product in step 24.

When it is the bidding closing time, the server computer 11 checks whether or not there are any bids during a suspension period in step 25. If

there is no bid during the suspension period, the auction is closed the bidding period in step 29. If there are some bids during the suspension period, the time of the last bid among the bids is detected. The server computer 11 sets an additional period which starts from the time of the last  
5 bid in step 26 so that the bidding period for the product can close at a time obtained by adding the additional period to the time of the last bid.

Immediately after a bidder newly bids after the suspension period started, the server computer 11 can provide an additional period for bidders. In this case, the result will be the same as the previous method eventually.  
10 Also, if a bidder newly bids during the suspension period, a new bidding closing time can be set by adding an additional period to the original bidding closing time. Through these methods, bidders who bid for the product or those who are interested in buying the product can continuously participate in the auction during the additional period in step 27.

15 The server computer 11 checks whether or not there are any bids during the additional period in step 28. If there is no new bid during the newly set additional period, the auction is closed in step 29, and if there is a bid during the additional period, the time for the bid is detected. The server computer 11 sets another additional period starting from the time for  
20 the new bid in step 26 so that the bidding period for the product can close at a time obtained by adding an additional period to the time for the new bid.

In this case, for resetting of an additional period, the frequency of resetting can be determined, no resetting of an additional period can be permitted, or a reset additional period can be shorter than the preceding  
25 additional period. This is to prevent the auction from extending too long.

A clock means installed in the server computer 11 performs detecting a bid time, a bidding closing time, and an additional period closing time. Methods and programming required for implementing the clock means can be easily implemented by a person skilled in this field.

30 Referring to FIGS. 3A and 3B, the method for automatically extending a bidding period described referring to FIG. 2 will now be

explained in detail. In this example, it is assumed that a bidding closing time ( $t_1$ ) is 16:45, 27<sup>th</sup> of October, 1999, and a suspension period is set to five minutes, and an additional period is set to five minutes. The suspension period need not be the same as the additional period, and  
5 different time periods can be set respectively. Also, following additional periods need not be the same as the first additional period. Following additional periods can be gradually shorter.

Referring to FIG. 3A, a bidder Poker 100 bids ₩250,000 at 16:32, 27<sup>th</sup> of October, 1999. Then a bidder Sangh bids ₩242,000 at 16:43, 27<sup>th</sup>  
10 of October, 1999. Since the bid by Sangh was made during the suspension period ( $D_1$ ), an additional period ( $D_2$ ) is set from the time of the bid. The additional period ( $D_2$ ) is set at a time ( $t_2$ ) obtained by adding five minutes to the time of the bid.

A bidder A114 bids ₩265,000 at 16:46, 27<sup>th</sup> of October, 1999. Since  
15 the bid by A114 was made during the additional period ( $D_2$ ), another additional period ( $D_3$ ) is set. The additional period ( $D_3$ ) is set at a time ( $t_3$ ) obtained by adding five minutes to the time of the bid. If there is no bid during the additional period ( $D_3$ ), the bidding process is closed, and if there is a bid, the bidding process described above is repeated.

20 If the number of a product to be auctioned is one, a bidder whose bid is the highest among other bidders will buy the product. In this case, even though a bidder makes a bid lower than the current highest bid during the suspension period or the additional period, another additional period may not be provided for bidders. Likewise, in an auction where the number of  
25 products to be auctioned is 10, if a bidder bids lower than the current highest ten bids during the suspension period or the additional period, another additional period may not be provided for the bid. If another additional period is provided for such cases, the bidding period will be extended unnecessarily without actually changing an accepted bidder or  
30 bid.

In 'a reverse auction', if new sales condition information is offered

and the price of the new sales condition information is higher than those of other sales condition information provided by the time when the new sales condition information is offered, it can be deemed that there is no offering of the new sales condition information. Also, in addition to the price, less  
5 competitive sales condition information than previously offered sales condition information can be deemed not existing.

This kind of judgement standard can be offered by a buyer. An example is a case in which a 32MB RAM is provided for a buyer who wants to buy a 64MB RAM. In this case, if the buyer provides in advance a  
10 condition in which he will not accept a product having lower capacity than a 64MB RAM, the judgement standard can be applied and otherwise, the purchase can be made after whether the buyer will accept the sales condition is confirmed through a mail or a call.

In addition to the methods, whether or not a bid has competitiveness  
15 can be determined by various conditions. In 'a reverse auction', after a bidding period for offering sales condition information closes, a buyer can determine his buying intention, comparing provided sales condition information.

The embodiment of the present invention described above explained  
20 the online auction using the Internet as an example. However, an auction using other communication networks, for example, a public switched telephone network, can also be implemented. A method in which information from a server is provided to a buyer or seller and vice versa can be implemented in various ways using an ordinary programming skill, which  
25 is easily understood by a person in the field of this technology.

The bidding closing time or the closing time for offering sales condition information described above can be an option in each auction. A seller (a buyer in 'a reverse auction', hereinafter referred to as "seller or the like") who does not want the extension of the bidding period will not want to  
30 apply the method for extension. If the seller or the like does not explicitly express his intention to refuse to apply the method for extension, a buyer

(a seller in 'a reverse auction') can ask to apply the method for extension. Also, the seller or the like can ask to apply the method in the process of an auction.

The present invention may be embodied in a code, which can be  
5 read by a computer, on a computer readable recording medium. The computer readable recording medium includes all kinds of recording apparatuses on which computer readable data are stored.

The computer readable recording media includes storage media such as magnetic storage media (e.g., ROM's, floppy disks, hard disks,  
10 etc.), optically readable media (e.g., CD-ROMs, DVDs, etc.) and carrier waves (e.g., transmissions over the Internet). Also, the computer readable recording media can be scattered on computer systems connected through a network and can store and execute a computer readable code in a distributed mode.

15

#### Industrial Applicability

As described above, according to a method for automatically extending a bidding period, when a bidder newly bids immediately before a bidding closing time, the bidding period is continuously extended for a  
20 predetermined time period. By doing so, despite the bid immediately before the bidding closing time, other bidders can have opportunities for additional bids.

Therefore, despite a bidding closing time, a buyer who wants to buy a product can have maximum opportunities for bidding for the product, while  
25 a seller can sell his product at the highest price.

Also, the method of the present invention can be applied to 'a reverse auction' as described above. That is, by extending the closing time for offering sales condition information, a buyer and sellers in a reverse auction can receive services that satisfies their needs to the maximum.

30



What is claimed is:

1. A method for automatically extending a bidding period, in an auction conducting method wherein an auction is performed online through a communication network, the method for automatically extending a bidding  
5 period comprising the steps of:
  - (a) providing information on a bidding closing time and a product to be auctioned to buyers;
  - (b) at least one or more buyers bidding for the product;
  - (c) checking whether or not a new bid exists in a predetermined time  
10 period before the bidding closing time; and
  - (d) if a new bid exists in the predetermined time period before the bidding closing time, extending the bidding closing time, and otherwise closing the auction at the bidding closing time.
- 15 2. The method of claim 1, wherein the step (a) further comprises a step for setting a suspension period that is a predetermined time period before the bidding closing time and an additional period that is used to extend the bidding closing time; in the step (c) whether or not a new bid exists in the suspension period is checked; and in the step (d) the bidding  
20 closing time is extended according to the additional period.
3. The method of claim 2, wherein the extended bidding closing time in the step (d) is obtained by adding the additional period to the originally set bidding closing time.
- 25 4. The method of claim 2, wherein the extended bidding closing time in the step (d) is obtained by adding the additional period to the time of the new bid during the suspension time.
- 30 5. The method of claim 1, further comprising the step of:  
at least one or more buyers requesting to change an auction mode

into an auction extension mode where the bidding closing time of the auction can be extended.

6. The method of claim 1, wherein when a new bid exists in the  
5 step (c), if the new bid is lower than a bid which will be an accepted bid if the bidding period closes at the time of the new bid, the new bid is deemed not existing.

7. The method of claim 1, further comprising the step of:  
10 (e) repeating the step (d) if a new bid exists during the extended period.

8. The method of claim 7, wherein when the step (d) is repeated  
in the step (e), a period to be extended is shorter than the previously  
15 extended period.

9. A method for automatically extending a bidding period, in an auction conducting method wherein an auction is performed online through a communication network, the method for automatically extending a bidding  
20 period comprising the steps of:

(a) a buyer providing buying condition information including the specification of a product which the buyer wants to buy;

(b) at least one or more sellers providing sales condition information including the specification of a product which the sellers can provide  
25 responding to the buying condition information;

(c) checking whether or not new sales condition information exists in a predetermined time period before the closing time for offering sales condition information;

(d) if new sales condition information exists in the predetermined  
30 time period before the closing time, extending the closing time for offering sales condition information, and otherwise closing the auction at the closing

time for offering sales condition information; and

(e) the buyer determining products to buy with provided sales condition information after the closing time for offering sales condition information.

5

10. The method of claim 9, wherein the step (a) further comprises a step for setting a closing time for offering sales condition information, a suspension period that is a predetermined time period before the closing time for offering sales condition information, and an additional period that  
10 is used to extend the closing time for offering sales condition information; in the step (c) whether or not new sales condition information is offered in the suspension period is checked; and in the step (d) the closing time for offering sales condition information is extended according to the additional period.

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11. The method of claim 9, wherein when new sales condition information is offered in the step (c), if the new sales condition information has a price higher than a price that is the lowest among sales condition information provided by the time of offering the new sales condition  
20 information, the new sales condition information is deemed not existing.

12. The method of claim 1, after the step (d) further comprising the step of:

(d1) repeating the step (d) if new sales condition information is  
25 offered during the extended period.

13. A computer readable recording medium which stores a program for executing a method for conducting an auction online through a communication network, wherein the method comprising the steps of:

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- (a) providing information on a product to be auctioned;
- (b) at least one or more buyers bidding for the product;

(c) checking whether or not a new bid exists in a predetermined time period before the bidding closing time; and

(d) if a new bid exists in the predetermined time period before the bidding closing time, extending the bidding closing time, and otherwise  
5 closing the auction at the bidding closing time.

14. A computer readable recording medium which stores a program for executing a method for conducting an auction online through a communication network, wherein the method comprising the steps of:

10 (a) a buyer providing buying condition information including the specification of a product which the buyer wants to buy;

(b) at least one or more sellers providing sales condition information including the specification of a product which the sellers can provide responding to the buying condition information;

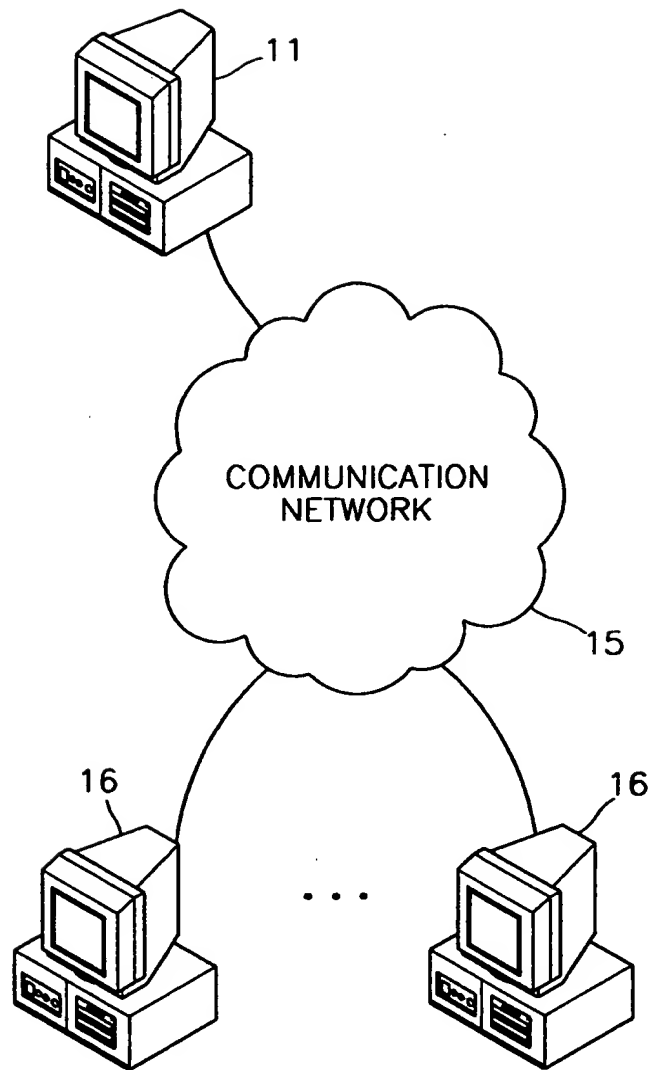
15 (c) checking whether or not new sales condition information exists in a predetermined time period before the closing time for offering sales condition information;

(d) if new sales condition information exists in the predetermined time period before the closing time, extending the closing time for offering  
20 sales condition information, and otherwise closing the auction at the closing time for offering sales condition information; and

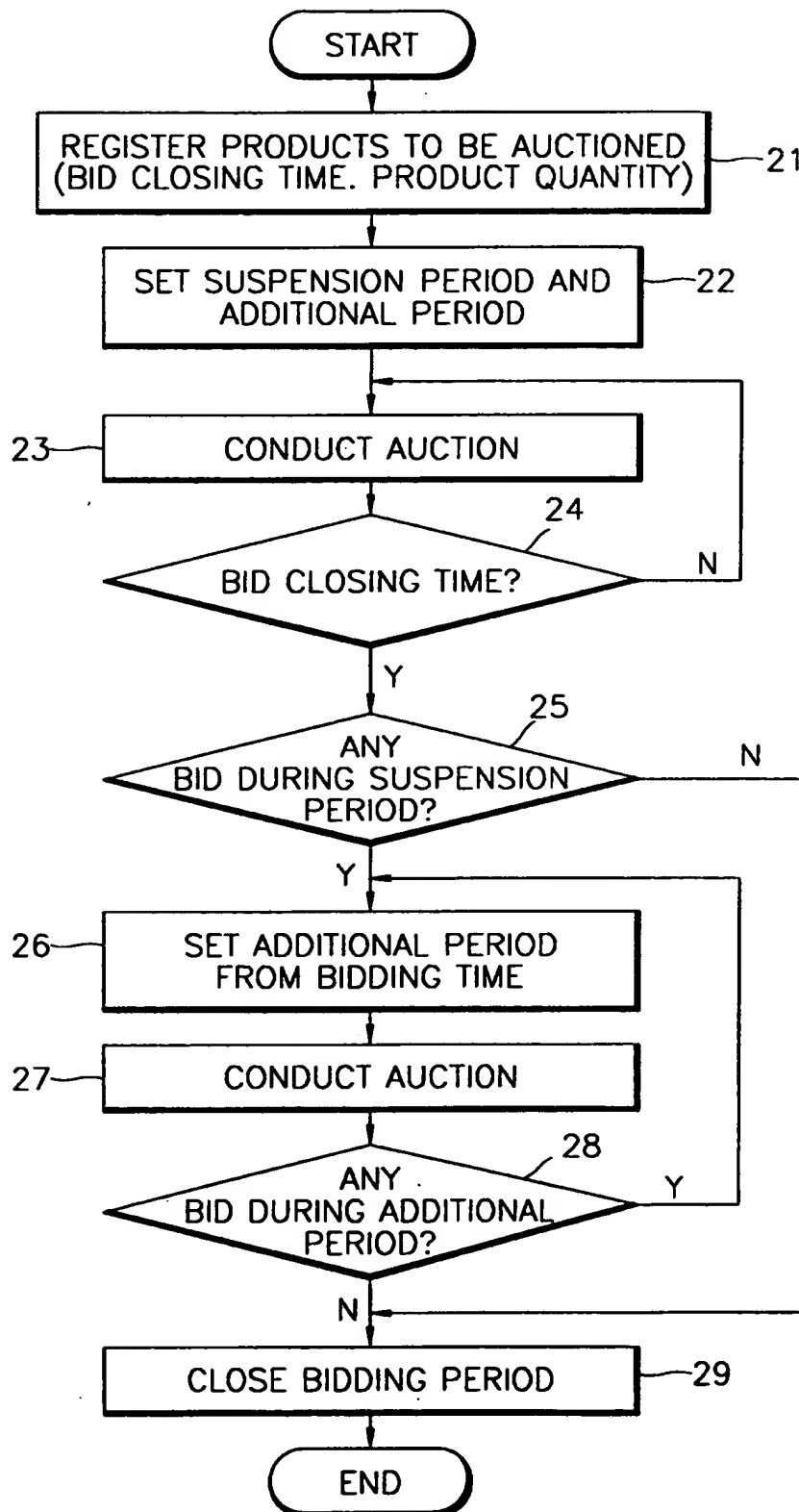
(e) the buyer determining his buying intention with provided sales condition information after the closing time for offering sales condition information.

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**FIG. 1**



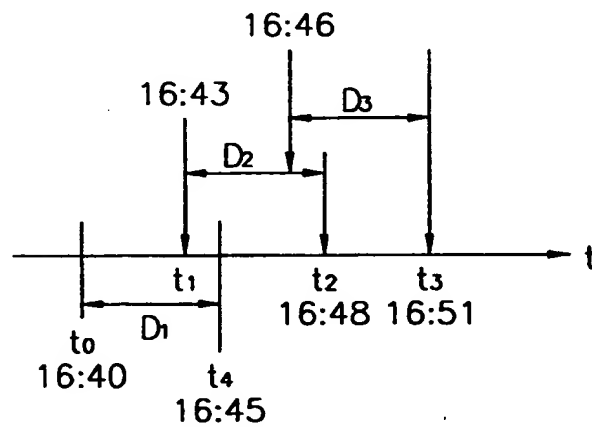
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**FIG. 2**



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**FIG. 3A**

BIDDER	BIDDING TIME	BIDDING PRICE
POKER 100	99.10.27 16:32	250,000
SANGH	99.10.27 16:43	242,000
ALL4	99.10.27 16:46	265,000

**FIG. 3B**

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR00/01454

**A. CLASSIFICATION OF SUBJECT MATTER****IPC7 G06F 17/60**

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC7 G06F 17/60

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Patents and applications for inventions since 1975 and Korean Utility models and applications for Utility models since 1975  
Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, A	KR 2000-53683 A (Kim Sun Min) 5 SEPTEMBER 2000 the whole document	I-14
P, A	KR 2000-36493 A (Choi Chung Youb etc.) 5 JULY 2000 the whole document	I-14

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"I" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

24 MARCH 2001 (24.03.2001)

Date of mailing of the international search report

26 MARCH 2001 (26.03.2001)

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